

WHAT IS CLAIMED IS:

1. A shower head for a deposition chamber, comprising:
 - a first plurality of holes for distributing a first source chemical to the deposition chamber; and
 - first flow regulators proximate to each of the first holes for controlling the flow of the first source chemical to the chamber.
2. The shower head of claim 1, wherein the first flow regulators comprise a device selected from the group consisting of a valve, pump, or flow controller.
3. The shower head of claim 1, wherein the first flow regulators are capable of vaporizing the first source chemical.
4. The shower head of claim 1, further comprising a controller coupled to the first flow regulators for controlling the flow of the first source chemicals to the chamber.
5. The shower head of claim 4, wherein the controller is capable of controlling each of the first flow regulators independently.
6. The showed head of claim 1, wherein the first flow regulators comprise a piezoelectric actuator.
7. The shower head of claim 1, further comprising:
 - a second plurality of holes for distributing a second source chemical to the deposition chamber; and
 - second flow regulators proximate to each of the second holes for controlling the flow of the second source chemical to the chamber.

8. The shower head of claim 7, further comprising a controller coupled to the second flow regulators for controlling the flow of the second source chemical to the chamber.

9. The shower head of claim 8, wherein the controller is capable of controlling the first flow regulators in unison, and is capable of controlling the second flow regulators in unison.

10. A shower head for a deposition chamber, comprising:
a first plurality of holes for distributing a first source chemical to the deposition chamber; and
first means proximate to each of the first holes for controlling the flow of the first source chemical to the chamber.

11. The shower head of claim 10, wherein the first means comprise a device selected from the group consisting of a valve, pump, or flow controller.

12. The shower head of claim 10, wherein the first means are capable of vaporizing the first source chemical.

13. The shower head of claim 10, further comprising a controller coupled to the first means for controlling the flow of the first source chemicals to the chamber.

14. The shower head of claim 13, wherein the controller is capable of controlling each of the first means independently.

15. The shower head of claim 10, wherein the first means comprises a piezoelectric actuator.

16. The shower head of claim 10, further comprising:

a second plurality of holes for distributing a second source chemical to the deposition chamber; and
second means proximate to each of the second holes for controlling the flow of the second source chemical to the chamber.

17. The shower head of claim 16, further comprising a controller coupled to the second means for controlling the flow of the second source chemical to the chamber.

18. The shower head of claim 17, wherein the controller is capable of controlling the first means in unison, and is capable of controlling the second means in unison.

19. A gas delivery system for a deposition chamber, comprising:
a first line coupleable to a first source chemical, wherein the first line communicates with a plurality of first holes in communication with the chamber; and
a second line coupleable to a second source chemical, wherein the second line communicates with a plurality of second holes in communication with the chamber.

20. The gas delivery system of claim 19, further comprising:
first flow regulators proximate to each of the first holes for controlling the flow of the first source chemical to the chamber; and
second flow regulators proximate to each of the second holes for controlling the flow of the second source chemical to the chamber.

21. The gas delivery system of claim 20, wherein either the first or second flow regulators comprises a device selected from the group consisting of a valve, pump, or flow controller.

22. The gas delivery system of claim 20, further comprising a shower head for housing the first and second flow regulators devices and the first and second lines.
23. The gas delivery system of claim 19, wherein the first and second holes are located in an area on the chamber, and wherein the first and second holes are evenly distributed about the area.
24. The gas delivery system of claim 23, further comprising a shower head, and wherein the area is located on the shower head.
25. The gas delivery system of claim 20, wherein either the first or second flow regulators are capable of vaporizing either the first or second source chemicals.
26. The gas delivery system of claim 20, further comprising a controller coupled to the first and second flow regulators for controlling the flow of the first and second source chemicals to the chamber.
27. The gas delivery system of claim 26, wherein the controller is capable of controlling each of the first and second flow regulators independently.
28. The gas delivery system of claim 26, wherein the controller is capable of controlling the first flow regulators in unison, and is capable of controlling the second flow regulators in unison.
29. A deposition system, comprising:
a deposition chamber containing a support for holding a substrate onto which a film is to be deposited;
a first source chemical coupled by a first line to a plurality of first holes in communication with the chamber; and

a second source chemical coupled by a second line to a plurality of second holes in communication with the chamber.

30. The deposition system of claim 29, further comprising:
first flow regulators proximate to each of the first holes for controlling the flow of the first source chemical to the chamber; and
second flow regulators proximate to each of the second holes for controlling the flow of the second source chemical to the chamber.
31. The deposition system of claim 30, wherein either the first or second flow regulators comprises a device selected from the group consisting of a valve, pump, or flow controller.
32. The deposition system of claim 30, further comprising a shower head for housing the first and second flow regulators devices and the first and second lines.
33. The deposition system of claim 30, wherein the first and second holes are located in an area on the chamber, and wherein the first and second holes are evenly distributed about the area.
34. The deposition system of claim 33, further comprising a shower head, and wherein the area is located on the shower head.
35. The deposition system of claim 30, wherein either the first or second flow regulators are capable of vaporizing either the first or second source chemicals.
36. The deposition system of claim 30, further comprising a controller coupled to the first and second flow regulators for controlling the flow of the first and second source chemicals to the chamber.

37. The deposition system of claim 36, wherein the controller is capable of controlling each of the first and second flow regulators independently.

38. The deposition system of claim 36, wherein the controller is capable of controlling the first flow regulators in unison, and is capable of controlling the second flow regulators in unison.

39. A method for delivering at least a first and second source chemical into a deposition chamber, comprising:

conveying the first source chemical by a first line to a plurality of first holes in communication with the chamber; and
conveying the second source chemical by a second line to a plurality of second holes in communication with the chamber.

40. The method of claim 39, conveying the first and second source chemicals includes respectively the use of first and second flow regulators, wherein the first and second flow regulators are respectively proximate to the first and second holes.

41. The method of claim 40, wherein either the first or second flow regulators comprises a device selected from the group consisting of a valve, pump, or flow controller.

42. The method of claim 40, wherein the chamber includes a shower head for housing the first and second flow regulators devices and the first and second lines.

43. The method of claim 39, wherein the first and second holes are located in an area on the chamber, and wherein the first and second holes are evenly distributed about the area.

44. The method of claim 43, further comprising a shower head, and wherein the area is located on the shower head.
45. The method of claim 40, wherein either first or second flow regulators vaporizes either the first or second source chemicals.
46. The method of claim 40, further comprising controlling the first and second flow regulators to control the flow of the first and second source chemicals to the chamber.
47. The method of claim 46, wherein each of the first and second flow regulators is controlled independently.
48. The method of claim 46, wherein the first flow regulators are controlled in unison, and the second flow regulators are controlled in unison.
49. The method of claim 39, further comprising vaporizer the either the first or second source chemicals respectively in the first line or the second line.
50. The method of claim 39, further comprising controlling the flow of either the first or second source chemical respectively in the first line or the second line.
51. The method of claim 46, wherein controlling the first and second flow regulators comprises activating the first flow regulators to convey the first source chemical into the chamber, and then activating the second flow regulators to convey the second source chemical into the chamber.
52. The method of claim 46, wherein controlling the first and second flow regulators comprises simultaneously activating the first and second flow regulators to convey the first and second source chemicals into the chamber.

53. The method of claim 46, wherein controlling the first and second flow regulators comprises activation of a piezoelectric actuator.

54. A method of depositing a film on a work piece in a deposition chamber, wherein the deposition chamber comprises a plurality of first holes in communication with a first source chemical and a plurality of second holes in communication with a second source chemical, the method comprising:

- (a) conveying the first source chemical through the first holes and into the chamber for a first period of time;
 - (b) conveying the second source chemical through the second holes and into the chamber for a second period of time after the first period of time; and
- repeating steps (a) and (b) to complete deposition of the film.

55. The method of claim 54, wherein conveying the first and second chemicals comprises respectively activating first flow regulators proximate to the first holes and second flow regulators proximate to the second holes.

56. The method of claim 54, wherein the first and second holes are located on a shower head coupled to the deposition chamber.

57. The method of claim 54, wherein either the first or second flow regulators comprises a device selected from the group consisting of a valve, pump, or flow controller.

58. The method of claim 54, further comprising:

- purging the first source chemical from the chamber after step (a); and
- purging the second source chemical from the chamber after step (b).

59. The method of claim 54, wherein the first source chemical comprises titanium, and wherein the second source chemical comprises nitride.

60. The method of claim 54, wherein the deposition chamber comprises a plurality of third holes in communication with a third source chemical, and wherein the method further comprises, after step (b):

(c) conveying the third source chemical through the third holes and into the chamber for a third period of time after the second period of time; and

repeating steps (a), (b), and (c) to complete deposition of the film.

60. The method of claim 60, further comprising:

purging the first source chemical from the chamber after step (a);

purging the second source chemical from the chamber after step (b);

and

purging the third source chemical from the chamber after step (c).

62. The method of claim 60, wherein the first, second, or third source chemicals contain an element selected from the group of titanium, barium, or strontium.

63. The method of claim 60, wherein the film is a BST oxide.

64. The method of claim 60, further comprising conveying an oxidizer to the chamber after step (c).